

REMARKS

Introduction

Claims 1 and 3-10 are currently pending in the application, of which claims 1, 6 and 7 are independent. Claims 1, 2 and 6 have been amended by this Amendment. Claim 2 has been cancelled.

Rejections under 35 U.S.C. § 102(b) and 35 U.S.C. § 103(a)

Claims 1 and 4-6 stand rejected under 35 U.S.C. 102(b) as being anticipated by *Feedforward Frequency Estimation for PSK a Tutorial Review*, IEEE Vol. 9, No. 2 March-April 1998; pg. 103-116 (*Morelli*).

Claims 2-3 and 7-9 stand rejected under 35 U.S.C. 103(a) as being unpatentable over *Morelli* in view of U.S. Patent No. 5,553,014 (*De León*).

Claim 1 has been amended to incorporate the features of original claim 2, which has now been cancelled.

Amended claim 1 of the present application recites a communication system that comprises, *inter alia*, "a transmitter and a receiver intended to receive symbols coming from a phase-shift keying modulation," and "estimation means for estimating a frequency error relating to a symbol based on a sequence of symbol phases, characterized in that said receiver comprises calculation means for calculating a phase sequence, called an initial sequence, based on decisions made on symbols, and means for detecting and correcting phase jumps in this initial sequence, to supply a phase sequence, called final sequence, to said frequency error estimation means."

The means for detecting and correcting phase jumps comprise "modifying means for modifying said initial sequence so as to produce a plurality of modified sequence, which each compensate for a phase jump configuration, calculation means for calculating straight line

equations which determine the initial sequence and the modified sequences," and "calculation means for calculating for the initial sequence and the modified sequences a mean difference between the initial or modified phases and the phases produced by the corresponding straight line equation, said final sequence being formed by the sequence whose mean difference is minimal."

Morelli describes a method of feedforward frequency estimation. As conceded by the Examiner, *Morelli* does not describe all of the features recited by amended claim 1 of the present application. For example, as conceded by the Examiner, *Morelli* does not teach, describe or suggest "calculation means for calculating for the initial sequence and the modified sequences a mean difference between the initial or modified phases and the phases produced by the corresponding straight line equation, said final sequence being formed by the sequence whose mean difference is minimal."

For these deficiencies, the Examiner cites *De León*.

Applicant submits that *De León* describes an adaptive filter system including a coefficient calculator, but does not cure the deficiencies of *Morelli*.

De León is directed to an acoustic signal processing system for canceling out echoes between, for example, loudspeakers and microphones. (See *De León* at, for example, Abstract, col. 1, lns. 36-47, and FIG. 1). *De León*, does not teach, describe or suggest anything to do with, for example, the claimed "transmitter and a receiver intended to receive symbols coming from a phase-shift keying modulation," and "estimation means for estimating a frequency error relating to a symbol based on a sequence of symbol phases"

Moreover, *De León*, either taken alone, or in combination with *Morelli*, does not teach, describe or suggest those features in combination with "calculation means for calculating for the initial sequence and the modified sequences a mean difference between the initial or modified phases and the phases produced by the corresponding straight line equation, said final

sequence being formed by the sequence whose mean difference is minimal," as recited by amended claim 1 of the present invention.

Accordingly, applicants submit that neither *Morelli* nor *De León*, either taken alone, or in combination, teach, describe or suggest the invention recited by claim 1 of the present application, and thus, claim 1 is patentable over any *Morelli-De León* combination.

Amended claim 6, while differing in scope from claim 1, includes features similar to that of amended claim 1. For example, amended claim 6 recites a "method of estimating a frequency error relating to a received symbol coming from a phase-shift keying modulation, based on a sequence of symbol phases," including "modifying said initial sequence so as to produce a plurality of modified sequence, which each compensate for a phase jump configuration, calculating straight line equations which determine the initial sequence and the modified sequences, and calculating for the initial sequence and the modified sequences a mean difference between the initial or modified phases and the phases produced by the corresponding straight line equation, said final sequence being formed by the sequence whose mean difference is minimal."

Claim 7, while differing in scope from claim 1, recites several of the features described above with respect to claim 1. For example, claim 7 recites "a method of detecting and correcting phase jumps in an initial sequence of symbol phases coming from a phase-shift keying modulation." The method comprises "calculating for the initial sequence and the modified sequences a mean difference between the initial or modified phases and the phases produced by the corresponding straight line equation, said final sequence being formed by the sequence whose mean difference is minimal."

Accordingly, claims 6 and 7 are deemed patentable over any *Morelli-De León* combination for at least the same reasons discussed above with respect to the patentability of amended claim 1.

Each of claims 3-5, and 8-10 ultimately depend from one of claims 1, 6 and 7 and that have been shown to be patentable, and is likewise deemed to be patentable, for at least the reasons described above with respect to the patentability of claims 1, 6 and 7.

Thus, applicants submit that each of the claims of the present application are patentable over each of the references of record, either taken alone, or in any proposed hypothetical combination. Accordingly, withdrawal of the rejections to the claims is respectfully requested.

Conclusion

In view of the above remarks, reconsideration and allowance of the present application is respectfully requested.

Respectfully submitted,

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